

U.S. Fish and Wildlife Service  
Office of Subsistence Management  
Fisheries Resource Monitoring Program

Natural Resource Internship Program

2003 Annual Report and  
Final Report for Study 01-088

Submitted by  
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## **FINAL REPORT SUMMARY PAGE**

**Title:** Natural Resource Internship Program

**Study Number:** FIS 01-088

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**Management Region:** Kuskokwim

**Information Type:** Stock Status and Trends

**Issue(s) Addressed:** Capacity building of local individuals and organizations, or fostering a greater involvement in natural resource management and research activities, has been lacking throughout the region for some time. A greater involvement by local residents provides a sense of ownership which enhances communication and cooperation between interested parties; and it's only through cooperation and collaboration that all parties can work together thereby benefiting the resource.

**Study Cost:** \$97,089

**Study Duration:** 2001 - 2003

## **ACKNOWLEDGEMENTS**

The Kuskokwim Native Association would like to thank the following individuals for contributing to the success of this program. Doug Molyneaux of the Alaska Department of Fish and Game for his initial work with KNA to secure funding for the early stages of the Intern Program. The fisheries technicians from the George and Tatlawiksuk River weirs who taught, mentored and entertained the interns from the very beginning of the program, particularly during the busy operational periods when unexpected “things were happenin’”. The Whitefish Lake and Kuskokwim River Mark/Recapture Principal Investigators (Ken Harper and Carol Kerkvliet) and crews for their more recent support and contributions to the program. Robert Vanderpool of Vanderpool’s Flying Service and Tanana Air for providing safe transportation for the interns over the years. KNA would also like to thank the Office of Subsistence Management for providing funding for the past three years.

## EXECUTIVE SUMMARY

The Kuskokwim Native Association sponsors a Natural Resource Internship Program that is intended to generate an interest among regional youth towards fisheries management, fish biology, and foster a greater understanding of contemporary subsistence fisheries issues. Each year approximately 15 students work closely with fisheries technicians and biologists at ongoing summer field projects (i.e., salmon and whitefish enumeration projects). The objectives of the internship program are to: 1) teach interns basic fisheries management and conservation concepts, 2) encourage participants to pursue higher education and full-time careers in natural resource management 3) develop a skilled pool of future technicians to work on local cooperative fisheries projects, and 4) develop a greater capacity of people within the KNA region to participate in the management process of the valuable local natural resources. Most participating interns are high school students from the KNA region, but when space is available individuals from other locations have been accepted. The program is considered a type of free-choice learning, which by definition is learning that occurs most frequently outside of a school environment. Because much of the learning process associated with subsistence lifestyles is transferred from individual to individual, this program attempts to blend Traditional Ecological Knowledge with western science through the interactions between the students, their parents and local village subsistence users.

**Key Words:** Capacity building, chinook salmon, intern, salmon, subsistence, traditional ecological knowledge, weir, western science, whitefish

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## INTRODUCTION

The Kuskokwim River drainage provides extremely important fisheries resources which have supported a subsistence lifestyle for thousands of years. The subsistence king salmon fishery of the Kuskokwim Area is the largest and one of the most important in the state (Burkey et al. 2000). Studies by the ADF&G, Division of Subsistence, indicate that salmon contribute as much as 53 percent of the total pounds of fish and wildlife harvested annually in a Kuskokwim area community, and as much as 650 pounds per capita in some communities. The average annual subsistence salmon harvest between 1991 and 2000 includes 84,887 chinook; 41,793 sockeye; 70,537 chum and 36,712 coho salmon. There are 38 communities in the Kuskokwim Area consisting of 4,500 households, and approximately 1,500 of these households annually harvest salmon and resident species for subsistence use. Considering all fish species, the Department estimates that fish contribute 85 percent of total pounds of fish and wildlife harvested annually (Coffing 1991).

Because of the vast importance of these resources to the local people, they have a strong desire to participate in the management of the area's resources. At times local individuals, and organizations, feel that they have been left out of discussions or that their voices aren't being heard. There is little doubt that there exist sociological gaps between western science and traditional knowledge. One of the primary goals with the initiation of this project was to heighten local individuals' awareness as to what actually occurs at these "western science" projects. Although there were several local individuals employed at the two original weir projects, there was a need to get more individuals exposed to what the projects were all about. The intent of bringing in interns was to provide a knowledge base for them that they could take back to their homes and villages. Not only could they learn from participating in these projects, but since learning is a two way street, they often provided their local knowledge and perspectives to weir personnel. A greater involvement by local residents provides a sense of ownership which enhances communication and cooperation between interested parties; and it's only through cooperation and collaboration that all parties can work together thereby benefiting the resource.

So the Kuskokwim Native Association Student Internship Program began in 1998, and was funded through 1990 partly by the Jobs Training Partnership Act (JTPA) and grants from the National Fish and Wildlife Foundation and Bering Sea Fisherman Association; in-kind funding was provided by the Alaska Department of Fish and Game (ADF&G) and KNA. The project was first integrated into two salmon enumeration projects, the George and Tatlawiksuk River weirs, which were operated by ADF&G. Doug Molyneaux, the ADF&G Kuskokwim Area Research Biologist, worked closely with Liz Ande of KNA to prepare the grant proposals for funding the program. There were three broad goals established at this time: 1) heighten the local resident's awareness of the various fisheries projects occurring within the region, 2) train a pool of future technicians to work on ongoing or future natural resource projects and 3) encourage interns to pursue professional natural resource careers.

During the first year of implementation seven students participated in the program, then twelve the following year, and fourteen participated in 2000. There was a need to keep students busy during slow operational periods at the projects, and provide background

information for a better understanding of the purpose of some of the activities associated with the weir (e.g., water sampling, flow measurements etc.). A curriculum was designed by Mr. Steve Chamberlain during the winter of 2000 through a contract between him and KNA. The curriculum was revised by Mr. Chamberlain after reviewing the 2001 student's diaries. The intent of the curriculum was also to help the students understand how such a project relates to the management of local resources.

Funding for the program by the Office of Subsistence Management began in 2001. In 2002, the first full year of operation for the Whitefish Lake Weir Project (FIS #01-052), the program expanded to provide students the opportunity to work with species other than salmon. The Kuskokwim River Chum, Sockeye and Coho Salmon Mark/Recapture Project (FIS # 03-304) was included in 2003, when interns were able to participate in the operations of the Birch Tree Crossing camp.

## **METHODS**

Individuals between the ages of 14 and 19 are asked to fill out an application form which has space to write a short essay explaining why the student wants to participate in the program, and a parental consent form. Along with the application form is a list of necessary clothing and equipment that the students will need while visiting the camps because most camps are quite remote and provide few, if any, amenities. The current goal for participants is fifteen students, which is based upon the number of ongoing projects that can accommodate interns without compromising that project's objectives.

Each intern is usually placed according to his or her interest at a project site for one week. Since most projects are located at remote field camps, access is often limited to float plane or small boat. Students from villages other than Aniak or Red Devil are flown to Aniak by charter plane, and then transported to the appropriate project site via float plane or boat. Curriculum materials are either already at each field camp, or sent with the interns. Several texts and three videos provide the backbone of the curriculum. Because the majority of the cooperative projects that KNA is involved with deal with salmon, most interns learn predominantly about salmon and their life histories and habitat requirements, while the Whitefish Lake project focuses on whitefishes and pike.

During their visits, the interns participate in daily project routines which include fish enumeration, various biological sampling activities, habitat monitoring and general camp chores. Upon completion of the program and after all course work is turned in, each intern receives a \$250 stipend for his or her involvement. Following the field season, project personnel, agency biologists and KNA staff critique each student's performance and discuss opportunities for program improvement. Interns who demonstrate considerable enthusiasm and potential for future employment are given the opportunity to participate for two weeks the following year. If a student returns for the two week experience, they receive a \$500 stipend. In addition, one school credit was anticipated to be awarded to those students whose work met school standards.

Because there had only been one curriculum available, and several students returning for a second year or the two week option, the curriculum was revised in 2003 by Michelle Robinette (Partners College Intern) and Dave Cannon (Partner Fish Biologist) (Appendix

A). New brochures, texts and videos with more local pertinent information were added, as well as questions included that generated thought about ecosystem relationships and subsistence uses.

## **RESULTS**

Since the beginning of the Internship Program in 1998, the local projects hosted 72 interns; 39 since the program was funded by the Office of Subsistence Management. Of those 72 participants, at least five returned a second year and two participants spent two or more weeks during one season of project operation. One intern (Michael Middlemist) will be the crew boss for the 2004 George River weir season, and worked as a KNA technician at the Tatlawiksuk River weir the two previous years. Michelle Robinette, who participated in the program in 2001, was the Partners Biologist College Intern in 2003.

As of the writing of this report, no students have received High School credit for their participation in the Program although copies of their journals have been forwarded to the School District.

One student intern returning for a third year has requested permission to attend for two weeks for the second year in a row; he's demonstrated exceptional attitude and ability and holds great promise to be a true future contributor toward successful resource management. There is a high likelihood that he will be picked up as a full time intern under the Partners Program along with the normal Partner's College Intern.

2003 Results: A total of thirteen interns attended the four field camps; George (5), Tatlawiksuk (3) and Whitefish Lake (2) Weirs and the Mark/Recapture Population Estimate at Birch Tree Crossing (3). The Tatlawiksuk River Weir washed out on July 3<sup>rd</sup>, so only three interns were able to attend that project; participants signed up for later periods were placed at other projects. Pete Kaiser who was scheduled for two weeks at the Tatlawiksuk Project went to Whitefish Lake instead. One student attending the Whitefish Lake Weir became sick after a few days and left early.

One past intern, Michael Middlemist, worked as a KNA technician at the Tatlawiksuk River weir in 2002 and 2003. Michelle Robinette, who participated in the program in 2000 and 2001, was the Partners Biologist College Intern in 2003. One student intern returning for a third year has requested permission to attend for two weeks for the second year in a row; he's demonstrated exceptional attitude and ability and holds great promise to be a true future contributor toward successful resource management. There is a high likelihood that he will be picked up as a full time intern under the Partners Program along with the normal Partner's College Intern in 2004.

## RECOMMENDATIONS

In the past, it was always hoped that all participants would register at least two weeks before the first scheduled week of transporting the interns to the various projects. Unfortunately this has never been a reality. It is recommended that additional effort be made to supply all regional schools and Traditional Councils with applications and parental consent forms, and that the schools and councils encourage the students (and parents) to register early.

It is imperative that during the preseason project orientations that all materials are available to the technicians working on the projects, and that they become familiar with the materials prior to the interns arriving at camp. This has not happened on some projects, namely the Whitefish Lake Weir and the Mark/Recapture Project at Birch Tree Crossing. Informal discussions occurred, but thorough knowledge was expected to be gained as time passed. In addition, only informal discussion occurred this year at the end of the season. In the past, the George and Tatlawiksuk River Weirs were removed by the same crew members and the camps were dismantled at about the same time. As the crew members stored equipment in Aniak, a closeout meeting would occur and intern performances would be discussed. With the addition of more projects, and the differing closeout times, it was just too hectic to hold these discussions. It may be necessary to have each project's crew boss, with the other technicians input, write a critique of the intern's performance.

Better communication is needed between and among the Kuskokwim Native Association and the Kuspuk School District. A meeting between the Teachers, Principle and or Guidance Counselor and KNA's Partners Biologist and Education and Training Director should occur each fall to update all parties as to the progress of the program, critique the curriculum and ensure that students receive credit if they've met the requirements. Other meetings throughout the year may also be necessary. A more formal and comprehensive curriculum has been prepared, but if it were to be used it would need either of two actions: 1) to be incorporated into the school curriculum or 2) a separate week long session with all participants covering the material prior to the first week that interns leave for their visits to the projects.

It's recommended that the Kuskokwim Native Association Education and Training Director visit each project to become familiar with the facilities, working conditions, typical project work procedures unique to each project and the overall environment in which the interns are exposed to. In order for this project to be fully successful, either the Education Director or a seasonal hired specifically for this project (hired several weeks prior to the beginning of the field season) should coordinate all aspects of the field portion (e.g., student travel, curriculum coordination, chaperone needs, student critiques, etc.). This seasonal could be a highly motivated local individual, or preferably a college Education major interested in biology.



### **Literature Cited or Curriculum Materials**

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## APPENDIX A

### KNA Summer Intern Program Curriculum Questions (6/03)

These questions are to be answered as the week progresses because much of what is learned is an ongoing process. The seasonal technicians are familiar with the curriculum, and discuss and explain information when appropriate.

Often, the interns work side by side with the Fish and Game and KNA technicians, taking notes, counting fish and doing most of the routine duties that are expected of the normal camp crew.

Some of these questions are general in nature, and deal with animals other than fish. These are intended to demonstrate ecosystem relationships and possibly foster an interest in biology in general, as well as provide information for those that are more interested in terrestrial animals.

At each project site we have a video player, and we include several videos for the curriculum: Return of the Scarlet Salmon; Alaska's Harvest *Natural, Sustainable, Pure*; Deep Crisis which deals with the depletion of many of the ocean's fisheries and the Salmon Forest which demonstrates the importance of marine derived nutrients in freshwater systems.

Miscellaneous but pertinent pamphlets, brochures, posters and other informative materials are handed out as they become available to the Natural Resource Department.

Following are the questions (with the answers) asked of each student during the week. These questions are written in a binder and are given to each student at the beginning of the week so they know what to expect, and so they have an idea of what questions to ask, or what particular information they should pay attention to. Their responses to these questions are collected along with their journals and used to determine if their stipend is warranted.

What are natural resources?

All things found in nature that are used by humans for their benefit. Such things include oil, natural gas, coal, gold, gravel, moose, beaver, and fish.

What are renewable natural resources? Name a few that aren't mentioned above.

Living things that reproduce and generate offspring. Trees (firewood and building materials), salmon berries and blueberries, salmon, caribou, foxes, ptarmigan and spruce grouse.

What is meant by sustainable use of resources?

Using renewable resources wisely so that there are enough to go around for future generations.

There are some major differences between salmon and these other species of fishes; rainbow trout, Dolly Varden, lush, whitefish, pike and grayling. Can you think of the most important difference, and why it is so important?

Within a few weeks after spawning the salmon die. Their remains are eaten by many insects, birds, animals and fish (young and adult); the nutrients are used for growth. Plants also take up these nutrients through their roots and use the nutrients in a similar way as the animals, basically for growth.

What is the term used for salmon or other fish that spend their adult lives in the ocean, then return to freshwater to spawn pretty much in the same location that they were born?

Anadromous

What other species of fish found in this area are anadromous?

Smelt, sheefish, and some Dolly Varden and some whitefish.

Do salmon from the Atlantic Ocean die after spawning like the Pacific salmon we have?

No

What's the term used for fish that spend all their lives in freshwater?

Resident species

Name some resident species.

Pike, lush, grayling, blackfish, lake trout, rainbow trout, Arctic char.

Do all salmon spend the same amount of time in fresh or salt water?

No

Are all king salmon the same size when they return to spawn?

No

If not, why is that?

They spend different amounts of time in the ocean, some only 1 1/2 years while some 6 or 7 years.

So why then are pink salmon the smallest and all the same size?

They all spend the same amount of time in the ocean, about 1 1/2 years.

Sockeye (red), coho (silver) and chum must spend sometime in between 1 1/2 and 6 years in the ocean – how much?

Sockeye – 2 to 3

Chum – 3 or 4

Coho – 1 1/2

Since there are differences between adult salmon and how much time they spend in the ocean, is it possible that there are similar differences between the time that young salmon spend in freshwater before they leave for the ocean?

Yes, pink and chum salmon young go downriver and into the ocean when they are only several months old. The others usually spend at least 1 year or more in freshwater before going to sea.

Salmon grow quickly while in the ocean because food is plentiful, but do they eat when they return to local rivers to spawn?

No

What color are salmon when they leave the ocean and begin to swim up the Kuskokwim River?

Silver

How do salmon change when they are nearing spawning time?

They get darker (often reddish), their flesh begins to rot, sex organs mature, the males get hooked jaws and sharp teeth.

How do salmon find their way back to the same streams where they were born?

By smell, each stream has its own odor due to geology and other natural factors.

When salmon die, what happens to their bodies?

The flesh rots

- 1) Flesh is partially eaten by other animals (bears and birds)
- 2) They are partially eaten by insects (those living in water and on land)
- 3) They decompose and their nutrients (nitrogen, phosphorus and carbon) dissolve into the water and soil
- 4) Plants take up the nutrients from the soil and water

Name 3 animals that rely on adult salmon for food.

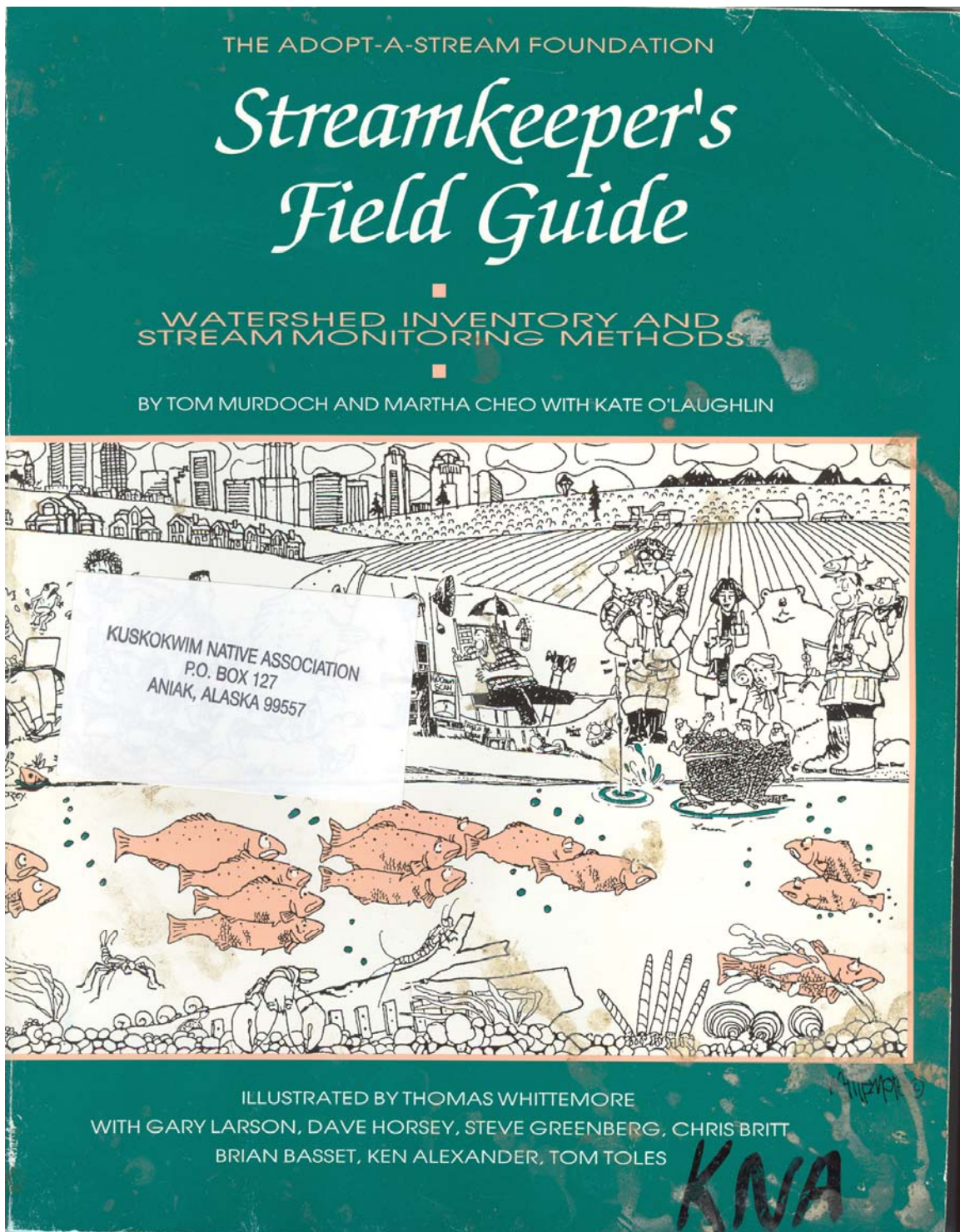
Bears, eagles, osprey, otters, gulls and occasionally wolves

Name 3 animals or other fish that rely on juvenile salmon for food.

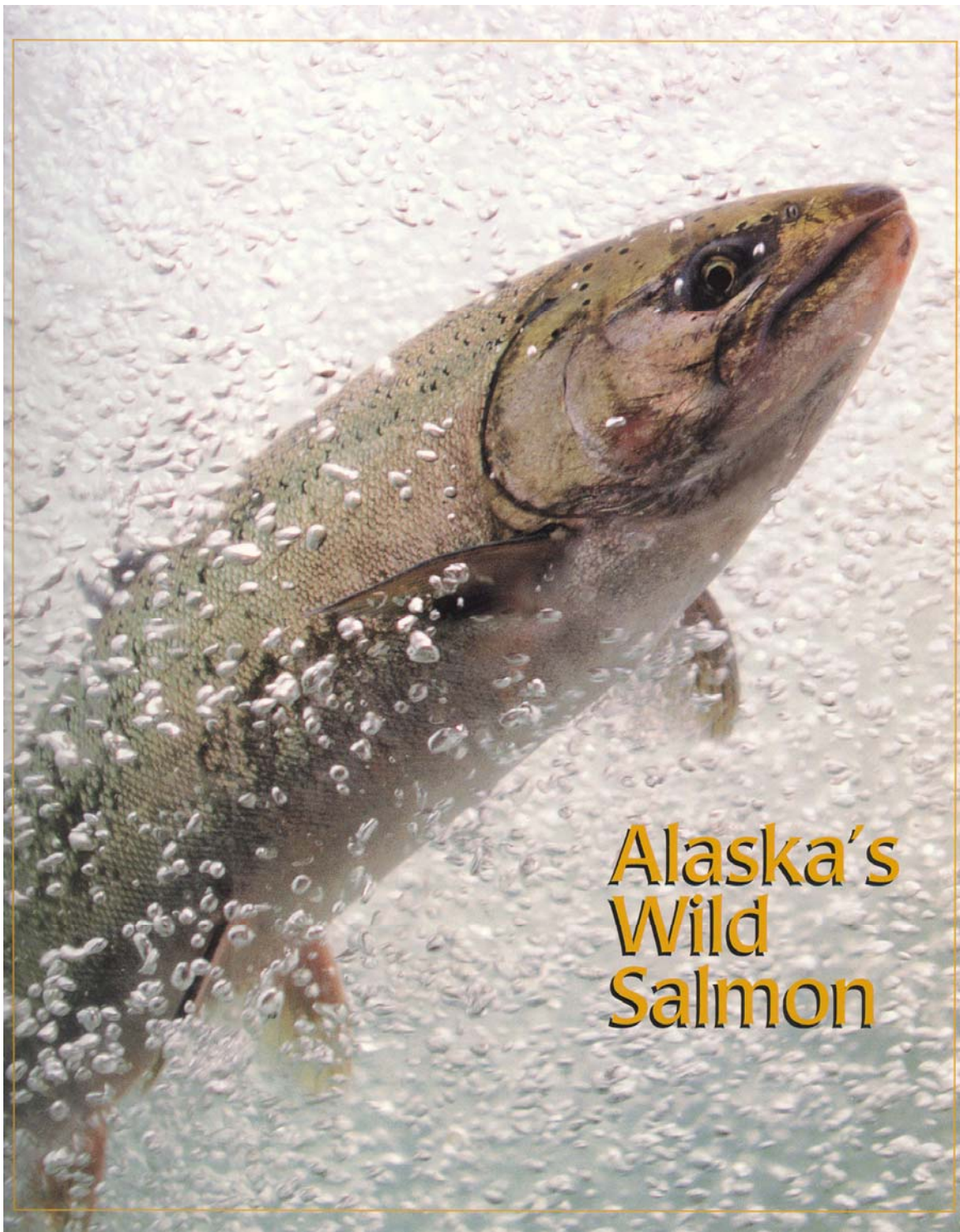
King fishers, terns, mergansers, otters, pike, rainbow trout, sheefish, grayling, Dolly Varden

## APPENDIX B

### Reference Materials











# FIELD IDENTIFICATION *of* COASTAL JUVENILE SALMONIDS

*by*

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Photography by Phil Edgell*



ALASKA  
POCKET  
GUIDE

# ALASKA'S FISH

A GUIDE TO SELECTED SPECIES



Robert H. Armstrong